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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,138	10/30/2003	Edmund Burke	TI-35260	9761

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EXAMINER

EVERHART, CARIDAD

ART UNIT	PAPER NUMBER
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2829

DATE MAILED: 03/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/697,138	Applicant(s) BURKE ET AL.	
	Examiner Caridad M. Everhart	Art Unit 2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Specification

The disclosure is objected to because of the following informalities: On the first page of the specification, there are blank spaces where information has been omitted. This information should be provided without the addition of any new matter.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 6, 7, 8, 9, 13, 14, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Sun(6,200,629B1).

Sun discloses forming a metallic layer 306 on metal interconnect structures 304a and 304b on a substrate(col. 3,ines 30-35 and Fig. 3a). Fig. 4 shows the layer patterned to form the lower electrode of the capacitor and a cladding of the interconnect(features 316b and 316a). The dielectric 318 of the capacitor 308a is the capacitor dielectric(col. 3, lines 39-40 and Fig. 4). The top electrode is 310b(col. 3, lines 42-46). Although the order of the patterning is not the same, the comprising language of the claim does not require the steps to be in the order in which they are written. It can be seen in Fig. 3c and 3D that the electrode is protected by the cladding during the etching. The dielectric is tantalum oxide(col. 3,lines 32-34) or may comprise silicon nitride, as the dielectric may be NO which is (silicon)nitride/oxide(col. 3, lines 32-34). The metallic

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layer may comprise copper(col. 3,lines 9-10 and have an antireflection layer of TiN(col. 3,lines 10-12), which it is known also acts as a barrier. The structure resulting from these steps is also shown in the cited figures.

Claims 1,3,6,8, 9, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Quek, et al. (US 6,261,917B1).

Quek, et al discloses a barrier metal layer is formed on an insulating layer(col. 2,lines 28-30), the barrier may be tantalum nitride(col. 2,lines 29-30), a metal layer is formed on the barrier and may be copper(col. 2,lines 30-35), a metal such as titanium or aluminum or tantalum is formed(col. 2, lines 40-43). The metal is oxidized only over the portion that will be formed into a capacitor(col. 2, lines 64-67 and col. 3,lines 1-5) which would result in tantalum oxide being the capacitor dielectric. A second metal layer is deposited which forms the top electrode layer and the cladding of the metal interconnect(col. 3,lines 6-10). The layers are patterned to form the capacitor and the interconnect(col. 3,lines 19-25). The structure resulting from the steps is also shown in the cited figures.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4, 5, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quek, et al in view of Shao, et al (US 6,117,747).

Quek et al is silent with respect to the material and the top electrode layer each comprising TaN.

Shao, et al is relied upon for its teaching of a layer of TaN in the top and bottom electrodes in a capacitor process in which the conductors include copper(col. 2, lines 60-65 and col. 3, lines 5-12).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the teaching of Shao et al with respect to the TaN layer in the top and bottom electrode of the capacitor and method taught by Quek et al because the material of the metallization taught by Quek et al includes copper, and Shao et al teach the including of a TaN layer in the layers that contact the copper metallization, which one of ordinary skill in the art would have found an obvious step to take in the method taught by Quek et al in order to act as a barrier layer for the copper layers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272- 1722 . The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

3-12-05

C. Everhart
Caridad M. Everhart
Patent Examiner